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| Patentanmeldung Nr. | Patent application No. | Demande de brevet n° |

99401564.2

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Im Auftrag

For the President of the European Patent Office

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Blatt 2 der Bescheinigung
Sheet 2 of the certificate
Page 2 de l'attestation

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Method for managing the consistency of service lists in a digital television system and receiver in such a system

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Method for managing the consistency of service lists in a digital television system and receiver in such a system

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This invention concerns the digital television field, and more specifically the exploitation of service information (SI) data. We can quote here the DSS (Direct Satellite System) system on which is based the implementation detailed below, even if the principle can easily be extended to other similar standards, such as the European DVB (ETSI document ref. EN300468) or ATSC (ATSC ref. A/56).

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New generation digital television systems include the possibility to broadcast applications in the bitstreams. These applications can then be downloaded by the receivers (set-top boxes), and be executed on their CPUs in order to present to the user some dedicated features related to the television services he or she can access. These applications are built on top of ad-hoc

15 Application Programming Interfaces (API) that offer the basic features available on the set-top box with which the high-level features to be proposed to the user can be built. Existingommercial software packages provide such an operating system for digital decoders.

20

One major feature of a digital receiver device is the management of the service lists displayed to the user. One of the first data the IRD must acquire before being operational is an image of the broadcast service list, described in the guide data contained in the bitstream. Then, the IRD software offers personalisation features, among which the possibility to create

25 customised service lists from this broadcast list and store them in non-volatile memory. One of these customised lists can then be selected and presented to the user as the list of all services it can possibly access. It is from this list that the user chooses the service he wants to watch.

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This invention applies to IRDs operating on any type of broadcast network, either satellite, cable or terrestrial. It deals with an efficient way to manage the consistency between the different service lists derived from the broadcast one by a user and stored in non-volatile memory. This has to be done in order to avoid such problems as a user trying to connect to a service

35 contained in one of its custom lists that has disappeared or been modified in the broadcast.

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Most up-to-date digital television systems offers the possibility to install IRDs (i.e. build the list of services accessible to the IRD – IRD standing for Integrated Receiver Decoder) by means of service information data. In the DSS system, this data is contained in what is referred to as the Master
5 Program Guide (MPG) that describes the services contained in the physical transport channels (PTC), grouping them by segments.

The advantage of using this as a reference is first to acquire all data necessary to build an up-to-date broadcast service list from one single
10 frequency (sometimes called the "barker channel") and then to be able to update this information without requiring any action from the user.

A classical feature contained in IRDs is the possibility to build one or several customised service lists according to personal preferences, and to store
15 them in non-volatile memory such that the user does not have to rebuild it every time the IRD is switched-off.

When an update occurs in the broadcast MPG, and if the IRD is listening to new versions of this program guide, the broadcast service list
20 managed by the IRD software will be updated accordingly. If services have been suppressed or modified (e.g. moved from one PTC to another), the customised service lists that have been derived from it should also be updated accordingly in order to make them consistent with it. Not performing this will result for the viewer in connections to non-existing services and hence
25 unexplained black-screens.

The following methods could be used to verify the coherence of the service lists:

- notifying the viewer of a change and asking him to check or rebuild all customised lists; this has one major drawback to request an explicit action
30 from the user, which can only tell him to re-edit its preference lists;

- checking in the customised service lists whether their content is still compatible with the broadcast one as soon as this one changes; this other technique can be time consuming depending on the number of services and of service lists.

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Both have as a major drawback the time consumption, in the first case from the user, and in the second from the CPU. The latter case is a problem as it can happen at any time in the IRD lifetime and then generate no

5　feedback periods to user requests.

The object of the invention is a method for managing the consistency of service lists in a digital television system characterised in that, in a receiver of said system, it comprises the steps of:

10　　　　　　　- storing at least one customised list of services;

- providing an application programmable interface trigger for triggering a consistency check between said at least one customised list of services and a downloaded update of a list of available services.

15　　　　Another object of the invention is a receiver in a digital television system characterised in that it comprises:

- a memory for storing at least one customised list of services;

- a demultiplexer for demultiplexing an updated list of services available in said system;

20　　　　　　　- means for checking the coherence between said at least one customised list of services and said updated list of services;

- a memory for storing an application adapted to trigger the checking of coherence by said means.

25　　　　Other characteristics and advantages of the invention will appear through the description of a non-restrictive embodiment of the invention.

The principle of the proposed invention consists in providing a feature that allows applications running on the IRD to explicitly trigger the

30　consistency check of any given customised list with the broadcast one whenever needed by means of adequate API elements. The main advantages of such a solution are to propose:

- an automatic way to perform this operation (without any action required from the operator),

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- a time effective way to perform this operation, as it can be done for a given service list (not all of them) at a time controlled by the application; this means that the waiting strategy is implemented at the application level.

5   The check is a complete one, based upon the principle of looking into the broadcast service list the content for each service contained in the given service list to be checked. For each service,

   - if it is not found in the broadcast list, it is removed from the given customised service list,

10   - if it is found but one of its parameters has been modified, the content of the customised service list is updated accordingly,

   - if it is found and it has not been modified, it is kept unchanged in the customised service list;

   When this is done, data corresponding to the customised service list
15   that is stored in non-volatile memory is updated accordingly and the application is notified of the end of the operation.

   Examples of usage of this feature by a dedicated IRD are given below to illustrate the possibilities offered by such a mechanism. In fact, they
20   correspond to two different broadcaster policies implemented through downloaded applications:

   - on the first IRD example, the preference service list edition is provided to a dedicated downloaded application called "electronic program
25   guide" that also provides navigation and program information retrieval features. The resulting lists are also used by another application called "surfing banner" that provides service connection and current broadcast information retrieval features. In such an IRD, the preference lists are checked against the broadcast ones by two means, both using the method described in this
30   document:
   * the first one is performed automatically when entering the given preference list edition screen in the EPG application,

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* as this feature is not invoked that often by the user, the surfing banner application also triggers the operation when a connection error is notified to it following a service connection trial.

5   On the second IRD example, the preference service list edition is provided via the user interface embedded in the IRD. The preference lists are then checked against the broadcast one by means of a dedicated maintenance application which is stored in the IRD non-volatile memory from the broadcast and which execution is delayed until the night time. When this time occurs, the
10   application is executed and it checks the consistency of all preference service lists against the broadcast one using the mechanism described in this document.

The benefits of the invention are to be able to provide an IRD with a feature that allows to check the consistency of all the customised service lists
15   stored in non-volatile memory with the content of the broadcast one. The proposed process has the major advantage of avoiding the situation in which the user selects a service contained in its customised lists and this one is not displayed. The main benefit of this process is that it is first an automatic one and probably most importantly a time effective one, as it can be very time
20   consuming. Another advantage is that the proposed feature is that it is can be optimised for a given IRD, whatever its features and configuration, as the process is offered through an API to applications running on the IRD.

Although the embodiment concerns service lists, the invention can
25   be adapted to other types of lists, such as for example event lists.

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Claims

1. Method for managing the consistency of service lists in a digital television system characterised in that, in a receiver of said system, it comprises the steps of:
- storing at least one customised list of services;
- providing an application programmable interface trigger for triggering a consistency check between said at least one customised list of services and a downloaded update of a list of available services.

2. Receiver in a digital television system characterised in that it comprises:
- a memory for storing at least one customised list of services;
- a demultiplexer for demultiplexing an updated list of services available in said system;
- means for checking the coherence between said at least one customised list of services and said updated list of services;
- a memory for storing an application adapted to trigger the checking of coherence by said means.

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Abstract

Receiver in a digital television system, in which service is information
5   relating to available services is broadcast.

The receiver comprises a memory for storing at least one
customised list of services, a demultiplexer for demultiplexing an updated list of
services available in said system, means for checking the coherence between
said at least one customised list of services and said updated list of services
10 and a memory for storing an application adapted to trigger the checking of
coherence by said means.

The invention also concerns a method for managing the consistency
of service lists in a digital television system characterised in that, in a receiver
15 of said system.

No drawing.